

## First Level Dictionary

The first level of the dictionary is life-cycle phase. The intent of this structure is to provide a life-cycle perspective of each program or project whether environmental restoration, waste management, or facility decommissioning and dismantlement. For simplification and ease of use, these phases are presented in matrix format and treated as columns.

This structure can also be presented in a non-matrix format. If a non-matrix approach were employed, each of the 33 second level (and associated lower levels) would be listed under each phase. In cases where the second level does not apply to the phase, a place holder number will be required. For example, although In Situ Biological Treatment does not apply to Phase 1 (Preliminary Site Investigation/Preliminary Phase), the associated second level number for this element will still be reported (i.e., .21 In-Situ Biological Treatment — not typically used in this phase). Though this element does not apply, there is nothing to preclude its usage - hence the statement, " does not typically apply."

The six phases are:

1. Preliminary Site Investigation/Preliminary Phase
2. Site Investigations/Studies and Research and Development
3. Remedial Design/Pre-construction
4. Remedial Action/Construction
5. Operations & Maintenance
6. Post Closure Surveillance and Long Term Monitoring

The six phases listed above apply to environment restoration, waste management, and facility decommissioning & dismantlement projects, but have slightly different definitions for each as shown below.

For environmental restoration projects conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) the phases are:

1. Preliminary Assessment/Site Investigation (PA/SI)
2. Remedial Investigation/Feasibility Study (RI/FS)
3. Remedial Design (RD)
4. Remedial Action (RA)
5. Operations & Maintenance (O&M)
6. Post Closure Surveillance & Long Term Monitoring

For environmental restoration projects conducted under Resource Conservation and Recovery Act (RCRA) the phases are:

1. RCRA Facility Assessment (RFA)
2. RCRA Facility Investigation/Corrective Measures Study (RFI/CMS)
3. Design portion of Corrective Measures (RD)
4. Corrective Measures Implementation (CMI)
5. Operations & Maintenance (O&M)
6. Post Closure Surveillance & Long Term Monitoring

For waste management projects the phases are:

1. Preliminary Planning — Waste/Special Material Operations
2. Pre-Conceptual Design/Research & Development
3. Waste Management Facility Design

4. Waste Management Facility Construction
5. Waste Management Facility Operations & Maintenance
6. On-Site Storage/Disposal Facility Surveillance & Long Term Monitoring

For facility decommissioning and dismantlement projects the phases are:

1. Pre-Decommissioning Actions
2. Facility Shutdown/Decommissioning and Research & Development
3. Decommissioning & Dismantlement Design
4. Decommissioning & Dismantlement Construction
5. Decommissioning & Dismantlement Operations & Maintenance
6. Post Closure Facility Surveillance & Long Term Monitoring

For underground storage tanks, the phases are:

1. Site Assessment (SA)
2. Remedial Action Plan (RAP)
3. Remedial Design (RD)
4. Implementation (IMP)
5. Remedial Action Operation (RAO)
6. Long Term Monitoring (LTM)

Frequently, interim actions- removal actions and interim remedial actions are performed to accelerate cleanup and reduce risk. Interim actions can significantly reduce or eliminate risk to human health and the environment. Actions such as installing fences and providing alternative drinking water supplies immediately reduce risks by eliminating potential exposure to contaminants. Actions such as source removal, capping, and pumping and treating groundwater stabilize sites by controlling or eliminating migration of contaminants. Although initiated as interim measures, many actions involving waste removal and treatment satisfy final cleanup requirements. During the investigation phase, opportunities for interim actions are constantly evaluated and implemented, where appropriate, to reduce risk and accelerate the overall restoration process.

To indicate an interim action, the letter ‘f’ (lower case) has been reserved in the Optional Level – Sub – project Identification. See following section for more details.

While the definitions for these phases are different, they each represent the same life-cycle phases for their respective project types. For the purposes of this structure and dictionary, only the generic titles mentioned above will be included in the following definitions of WBS elements. Each second level and third level element definition is structured to consider the effect that each phase has on the definition for that element. If the definition for an element changes according to phase, it will be documented.

## **Optional Level — Sub-project Identification**

There is an optional level category (field or column in the matrix format) between the First Level (i.e., Phases 1 through 6) and the Second Level WBS Elements. This level is optional because not all projects have sub-projects. An example of a project with sub-project may be where the same site (waste release site or single area of contamination) has more than one substantially different technical approach. For instance, a single project may require an interim removal action of contaminated soil (hot spot excavation); capping of contaminated area; and groundwater pump and treat. In this case the project may be better organized according to sub-projects. In this example, there are two sub-project(s) that address the soil excavation and capping, and another sub-project to address

groundwater. To standardize the use of the sub-project levels, the letter "i" (lower case) is reserved for Interim Removal Actions (IRA), and the letter "x" is reserved for elements of work such as Community Relations that have application across all sub-projects. The any alpha character can be used for the remained of the fields. In this example, the following elements may be included:

- IRA may include elements such as:
  - 2.i.03.14 *Interim Remedial Plans/Reports/approval* (assuming Phase 2)
  - 2.i.19.01 *Contaminated Soil Collection*.
- Solid/Soils Containment, Collection, or Control
  - 4.s.19.05 *RCRA C - Cap* ("s" is used for Soil, but any alpha other than "i" or "x" can be used)
- Groundwater Containment, Collection, or Control
  - 4.g.18.01 *Extraction Wells* ("g" is used for Groundwater, but any alpha other than "i" or "x" can be used)

In the matrix format, this optional level appears between the 6 phases and the numbering for the second level (reference Figure 7 - Summary Level Matrix). The conventions for using this optional level are as follows:

- If there are sub-projects, then alpha characters will be used — lower case a through z with the letters "i" and "x" reserved as mentioned before. As can be seen in Figure 7, there are five fields for sub-projects. In the example mentioned above, the letter "s" would be repeated in the second field (the character in the heading in Figure 7 is "a") next to each element of work required for the Capping project. It is unlikely that any one project would have more than five sub-projects, but there is no established limit. However, if there are more than five, then it may be desirable to divide the project into two or more projects.

- If an element such as "Community Relations" has application to all sub-projects then the letter "X" will be used. The numbering for this WBS element would then be:

➤ 1.x.02.02 for phase 1 — 2.x.02.02 for phase 2 — etc.

However, if the distinction of "Community Relations" is important, then it may be numbered:

➤ 1.s.02.02 for phase 1 — 2.s.02.02 for Phase 2 — etc.

➤ 1.g.02.02 for Phase 1 — 1.g.02.02 for Phase 2 — etc.

➤ 1.c.02.02 for Phase 1 — 1.c.02.02 for Phase 3 — etc.

- If the same WBS element is required for more than one sub-project, then it will be repeated accordingly. For example, if "Contaminated Soil Collection" for phase 4 activities in sub-project—"s", and sub-project—"c", then this WBS element will be used twice

➤ 4.s.19.02 for sub-project—"s" and 4.c.19.02 for Sub-project—"c".

Further, let say that the WBS element "Disposal Tipping Fees" are required for all Sub-projects during phase 4. The numbering for these WBS elements would then be:

➤ 4.s.33.03 for sub-project—"s", 4.g.33.03 for sub-project—"g", and 4.c.33.03 for sub-project—"c"

OR

➤ 4.x.33.03 for all Sub-projects if the distinction for this element is not important between sub-projects.

- If there are no sub-projects, then there will be no alpha characters in the WBS number. In this case, the numbering for the WBS element "Disposal Tipping Fees" for phase 4 would be:

➤ 4.33.03

This Optional Level is not considered to be one of the WBS levels. Whether or not it is used, the first level of the WBS is still Phases 1 through 6, and the second level is still the 33 major WBS elements from Program Management Support & Infrastructure to Disposal - Commercial.

